

- Halacaridae (Acari) aus dem Litoral der Nord und Ostsee. I systematik und Biologie. *Abh. Verh. naturwiss.* 16: 155-230.
- BARTSCH, I. (1975): Ein Beitrag Zur Rhombognathinen - Fauna (Halacaridae, Acari) der Bretagneküste. *Acarologia* 17: 53-80.
- BARTSCH, I. (1978): Eränzungen zur copidognathus - Fauna (Halacaridae: Acari) der Bretagne - küste. *Acarologia* 20: 217-234 (Published in 1979).
- BARTSCH, I. (1979): Halacaridae (Acari) von der Atlantikküste Nordamerika Beschreibung der Arten. *Mikrofauna Meeresboden* 79: 1-62.
- BARTSCH, I. (1982): Halacaridae (Acari) von der Atlantikküste des borealen Nordamerikas. Ökologische und tiergeographische Faunenanalyse. *Helgolander Meeresunters* 35: 13-46.
- BARTSCH, I. (1983): Vorschlag Zur Neugliederung des systems der Halacaridae (Acari). *Zool. Jb. Syst.* 110: 179-200.
- BARTSCH, I. (1986): Three new species of *Copidognathus* (Acari: Halacaridae) from the Philippines. *Philip. J. Sci.* 115: 43-54.
- GREEN, J. (1968): The biology of estuarine animals. Sidgwick & Jackson, London. pp. 233-235.
- GREEN, J. & MACQUITTY, M. (1987): Halacarid mites. *Synopses Br. Fauna (NS)* 36: 1-178.
- KRANTZ, G.W. (1978): A manual of acarology, 2nd edn. Oregon State Univ. Book Store:
- MORSELLI, I. & MARI, M. (1978): Alacaridi Di Acque Lagunari E. Costiere Della Toscana Meridionale. *Atti. Soc. Tosc. Sci. Nat. Mem. Serie. B.* 85: 63-86.
- MORSELLI, I. & MARI, M. (1981): *Anomalohalacarus affinis* n. sp. un alacaride. (Halacaridae) Acari delle coste Toscana. *ibid.* 87: 275-283.
- NEWELL, I.M. (1947): A systematic and Ecological study of the Halacaridae of Eastern North America. *Bull. Bingham Ocean. Coll.* 10: 1-247.
- NEWELL, I.M. (1984): Antarctic Halacaroida. *Antarct. Res. Ser.* 40: 1-284.
- POLICE, G. (1909): Alcune nuove specie di Halacridae de Golfo di Napoli. *Arch. Zool. Napoli.* 3: 409-443.
- SARMA, A.L.N. & RAO, D.G. (1980): The meiofauna of Chilka lake (Brackish water lagoon). *Curr. Sci.* 49: 870-872.
- SARMA, A.L.N. & SATAPATHY, S. (1980): A note on the phytal fauna in and around Balugaon in Chilka lake. *Curr. Sci.* 47: 242-245.
- SARMA, A.L.N., SATAPATHY, S. & RAO, D.G. (1981): Phytal macro and meiofauna of Chilka lake. *Ind. J. Mar. Sci.* 10: 61-65.
- VIETS, K. (1940): Meer esmilben aus der Adria (Halacaridae und Hydrachnellae, Acari). *Arch. Naturgesch.* 9: 1-135.

APHIDIID (HYMENOPTERA: APHIDIIDAE) FAUNA OF GARHWAL, WESTERN HIMALAYA¹

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(With nine text-figures)

Fifteen species of aphidiid (Hymenoptera: Aphidiidae) are recorded as parasitoids of aphids (Homoptera: Aphididae) from Garhwal range of western Himalaya. Out of these, 1 species, viz. *Aphidius polycostulari*, is new to science, two species, viz. *Praon orientale* Stary & Schlinger and *Praon pubescens* Stary, are new to Indian subregion and the rest are new to the Garhwal range of western Himalaya.

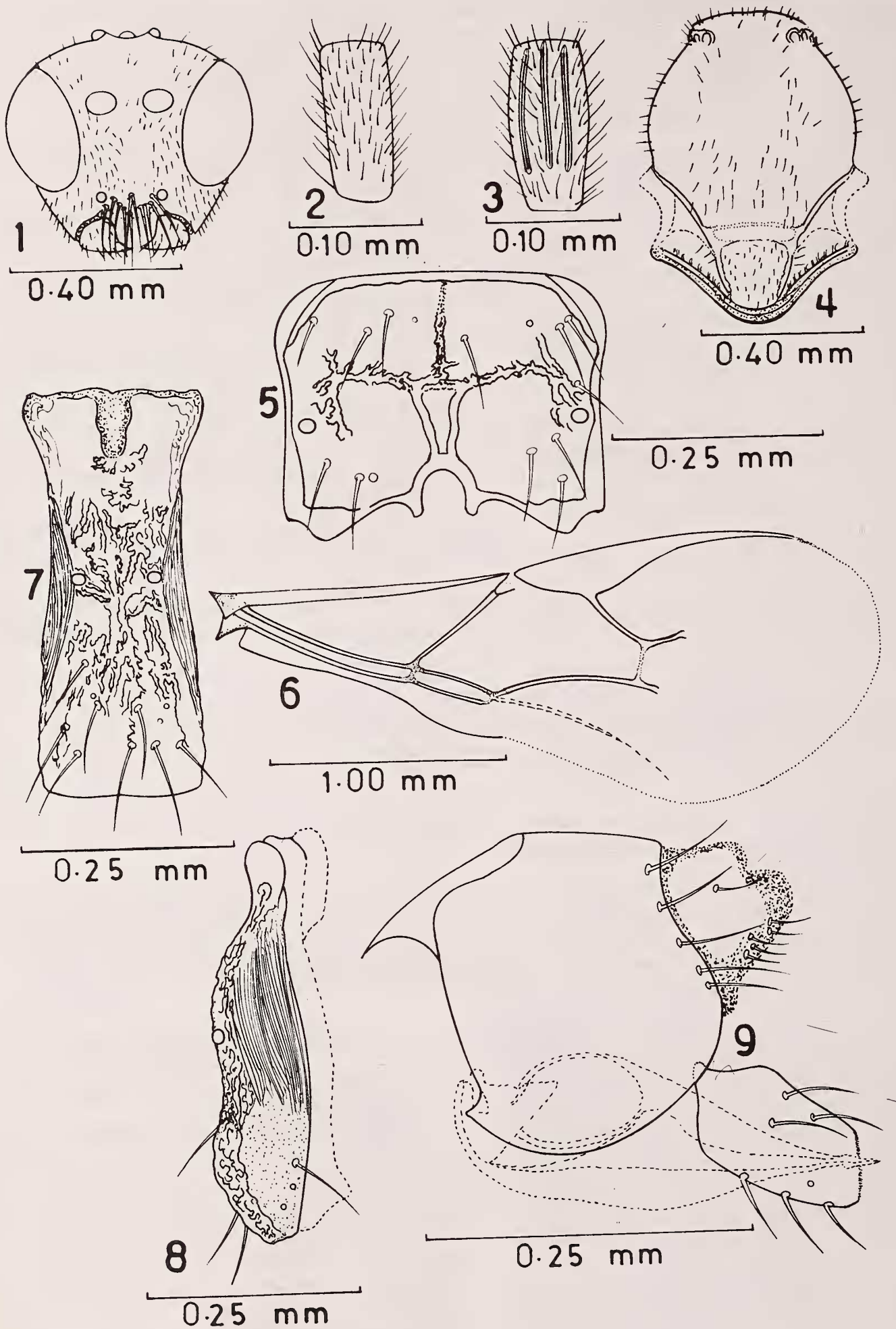
Garhwal range of western Himalaya comprises 214 aphid species (Saha and Chakrabarti 1987). Das and Chakrabarti (1986, 1988 a, b, c, 1989 a, b, c, 1990) altogether reported 20 aphidiid species under 8 genera attacking only 14% of the total aphid species from the said range of Himalaya. An additional 15 aphidiid species

under 8 genera are recorded in this paper, increasing the number of species from the area to 35 under 11 genera, attacking about 20% of the total aphid species. Out of the present 15 aphidiid species, one species, viz. *Aphidius polycostulari*, is new to science and two species, viz. *Praon orientale* Stary, and Schlinger and *Praon pubescens* Stary, are new to the Indian subregion. The rest of the species except *Lysaphidus qadrii* Shuja-Uddin are recorded here for the first time from the state of Uttar Pradesh. All these species are new to Garhwal range of western Himalaya.

¹Accepted September 1990

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Figs. 1 - 9. *Aphidius polycostulari* sp. nov, female. 1. Head, 2. First flagellar segment, 3. Second flagellar segment, 4. Mesonotum, 5. Propodeum, 6. Forewing, 7. Dorsal aspect of tergite 1, 8. Lateral aspect of tergite 1, 9. Genitalia..

Aphidius absinthii Marshall

Specimens studied: 5 females and 2 males, ex. *Macrosiphoniella kikungshana* Takahashi on *Artemisia* sp., c. 1875 m, 21 Aug. 1983; 2 females and 1 male, ex. *Macrosiphoniella* sp. on *Chrysanthemum* sp. Joshimath (c. 1875 m), 19 March 1984; 5 females, ex. unknown on *Artemisia* sp., Barkot (c. 1450 m), 25 May 1984 (coll. B.C. Das).

Aphidius cingulatus Ruthe

Specimens studied: 5 females, ex. *Pterocomma* sp. on *Salix tetrasperma* Roxb., Lambagarh (c. 2300 m), 22 July 1983 (coll. B.C. Das); 1 female, ex. *Pterocomma* sp. on *Populus citiata* Wall. Joshimath (c. 1875 m), 27 March 1984 (coll. K. Dey).

Aphidius polycostulari sp. nov. (Figs. 1-9)

Morphological characters: Females: Head (Fig. 1) transverse, smooth, shiny, sparsely haired; face with a narrow longitudinal area which is bordered by simple rows of hairs, the area between the rows and orbits with sparse hairs; longitudinal eye diameter 3.50 ± 0.35 x width of gena; tentorial index 0.55 ± 0.04 ; interocular line subequal to facial line, 1.67 ± 0.14 x transfacial line; transverse eye diameter 1.20 ± 0.04 x temple; ocellar triangle right; clypeus with 10-12 long hairs. Antennae 18-segmented, reaching to the end of tergite 3; F₁ (Fig. 2) little shorter than length of F₂ (Fig. 3); length of F₁ 2.53 ± 0.49 x width at base; length of F₂ 3.38 ± 0.24 x width at base; F₁ with 0 and F₂ with 3 rhinaria.

Mesoscutum of mesonotum (Fig. 4) with short hairs almost in two longitudinal rows on disc except near the prescutellar groove which is comparatively densely haired; notaulices distinct at the ascendent part, deep, crenulated, effaced on disc. Scutellum narrow, rugose, with comparatively dense short hairs on disc. Central areola of propodeum (Fig. 5) comparatively narrow. Upper longitudinal and lateral transverse carinae with many irregular processes; upper longitudinal carinae somewhat effaced before the upper margin of propodeum; upper areola with 4-6 and lower with 3-4 long hairs.

Pterostigma of forewing (Fig. 6) elongatedly triangular, length 3.60 ± 0.25 x width, 1.27 ± 0.06 x length of metacarp; length of radial abscissa 1 was 1.60 ± 0.09 x length of radial abscissa 2.

Length of tergite 1 (Fig. 7) 3.31 ± 0.36 x width at spiracles; dorsal surface with irregular net-like crenulation; lower portion with 8-14 long hairs; anterolateral area longitudinally costulated, number of costulae 25-30 (Fig. 8). Ovipositor sheaths (Fig. 9) slender, maximum length 1.94 ± 0.06 x maximum width; ovipositor as in figure.

Coloration: Head deep brown; face yellowish orange; mouth parts yellowish except deep brown apices of mandibles; scape yellowish, pedicel yellowish brown, basal ring of F₁ yellowish, rest of antennae brown; thorax blackish brown except yellowish orange pronotum and propleuron; legs yellowish orange except dark brown apices of tarsi; wing veins brown to colourless; tergite 1 dirty brown, ovipositor sheaths blackish brown, rest of abdomen dirty orange brown to yellowish brown.

Body length: 2.85 ± 0.15 mm.

Measurements of one female (in mm): Body length 2.80. Head: Tentorio-ocular line 0.07, intertentorial line 0.12, interocular line 0.37, facial line 0.38, transfacial line 0.23, width of gena 0.07, longitudinal eye diameter 0.27, transverse eye diameter 0.20, temple 0.17, length of antennae 2.16, length of F₁ 0.12, width of F₁ at base 0.05, length of F₂ 0.13, width of F₂ at base 0.04.

Forewing: Length of pterostigma 0.61, width of pterostigma 0.17, length of metacarp 0.48, length of radial abscissa 1 0.28, length of radial abscissa 2 0.17. Tergite 1: length 0.47, width at spiracles 0.14. **Ovipositor sheaths:** Maximum length 0.16, maximum width 0.08.

Male: Antennae 20-segmented, body length 2.56, F₁ with 2-4 and F₂ with 3-6 rhinaria; coloration generally darker than the female, otherwise like the female except for sexual differences.

Mummy: Dark brown.

Holotype: Female; INDIA: Uttar Pradesh, Garhwal, Joshimath (c. 1875 m), ex. *Macrosiphum* (*Sitobion*) sp. on *Rosa* sp., 27 October 1981 (coll. A.K. Mandal). Paratypes: 1 female and

1 male, collection data as in the holotype.

The present specimens are closely related with *A. rosae* Haliday (1834) in having tentorial index 0.51-0.59, ocellar triangle right and 18 antennal segments besides its host range. But it differs from the latter species by the number of costulae on anterolateral area of tergite 1, almost incomplete upper longitudinal carina and somewhat short pterostigma (in *rosae* number of costulae is 10-18, upper longitudinal carina is complete and pterostigma long).

Aphidius rosae Haliday

Specimens studied: 25 females and 4 males, ex. *Macrosiphum rosae* (Linn.) on *Rosa* sp., Osla (c. 2559 m), 8 Sept 1984; Joshimath (c. 1875 m), 15 September 1984, 21 April 1985. (coll. B.C. Das).

Aphidius urticae Haliday

Specimens studied: 6 females and 3 males, ex. *Acyrtosiphon* sp. on *Euphorbia pilosa* Linn., Bhyundar (c. 3000 m), 18 October 1982 (coll. A.K. Mandal).

Betulaxys intermedius Shuja-Uddin

Specimens studied: 5 females and 3 males, ex. *Capitophorus formosartemisiae* (Takahashi) on *Artemisia vulgaris* Linn., Joshimath (c. 1875 m), 27 September 1983 (coll. D. Dangwal); 3 females and 2 males, ex. *Capitophorus* sp. on *Artemisia* sp., Taluka (c. 1950 m), 6 September 1984 (coll. S. Saha).

Ephedrus minor Stelfox

Specimens studied: 1 female, ex. *Cavariella aegopodii* (Scopoli) on *Salix hastata* Linn., Joshimath (c. 1875 m), 28 Oct. 1985 (coll. B.C. Das).

Lipolexis scutellaris Mackauer

Specimens studied: 2 females, ex. *Liosomaphis himalayensis* Basu on *Berberis* sp., Hanumanchatti (c. 1900 m), 18 October 1981 (coll. S. Saha); 16 females and 24 males, ex. *Aphis gossypii* Glover on *Rumex* sp., Bhyundar (c. 3000 m), 8 October 1983 (coll. B.C. Das).

Lysaphidus qudrrii Shuja-Uddin

Specimens studied: 5 females and 3 males, ex. *Brachycaudus helichrysi* (Kaltenbach) on *Anaphalis* sp., Joshimath (c. 1875 m), 28 Oct. 1981 (coll. S. Raha); 10 females and 4 males, ex. *Brachycaudus* sp. on *Gnaphalium* sp., Chamoli (c. 960 m), 28 October 1981 (coll. A.K. Mandal); 20 females and 7 males, ex. *Capitophorus* sp., on *Anaphalis cinnamomea* Clarke, Musoorie (c. 2004 m), 21 April 1984 (coll. B.C. Das).

Praon orientale Stary & Schlinger

Specimens studied: 30 females and 21 males, ex. *Uroleucon* sp., on *Sonchus* sp., Barkot (c. 1450 m), 27 June 1983; 10 females and 3 males, ex. *Uroleucon* sp., on *Sonchus arvensis* Linn., Joshimath (c. 1875 m), 3 Aug. 1984 (coll. B.C. Das).

Praon pubescens Stary

Specimens studied: 2 females, ex. *Nasonovia* sp. on *Strobilanthes* sp., Helong (c. 1524 m), 26 July 1983 (coll. B.C. Das).

Praon volucre (Haliday)

Specimens studied: 4 females, *Macrosiphum* sp., on *Rosa* sp., Joshimath (c. 1875 m), 28 September 1984 (coll. B.C. Das).

Toxares sp.

Specimen studied: 1 female, ex. *Shinjia orientalis* (Mordvilko) on fern, Joshimath (c. 1875 m), 11 October 1983 (coll. B.C. Das).

Trioxyys (*Binodoxys*) *centaureae* (Haliday)

Specimens studied: 12 females and 5 males, ex. *Uroleucon* sp. on *Senecio* sp., Nannugaon (c. 3300 m), 23 June 1984 (coll. B.C. Das).

Trioxyys (*Binodoxys*) *rubicola* Shuja-Uddin

Specimens studied: 20 females and 11 males, ex. *Aphis ruborum longisetosus* Basu on *Rubus ellipticus* Smith, Sakri (c. 1800 m), 5 September 1984 (coll. B.C. Das).

ACKNOWLEDGEMENTS

We are thankful to Dr P. Stary, Institute of Entomology, Czechoslovak Academy of Scien-

ces, Czechoslovakia for verifying the identities of aphidiid species and to the Head, Dept. of Zoology, University of Kalyani for laboratory facilities.

REFERENCES

- DAS, B.C. & CHAKRABARTI, S. (1986): Mating and oviposition of *Kashmiria aphidis* (Aphidiidae: Hymenoptera). Proc. 2nd Nat. Symp. Recent Trends in Aphidological Studies Modinagar (Editor S.P. Kurl): 103-117.
- DAS, B.C. & CHAKRABARTI, S. (1988a): Immature stages of *Kashmiria aphidis* (Hymenoptera, Aphidiidae). *Acta Entomol. Bohemoslov.* 85: 16-20.
- DAS, B.C. & CHAKRABARTI, S. (1988b): Sex ratio of *Kashmiria aphidis* Stary and Bhagat (Hymenoptera: Aphidiidae) in the field. *Ann. Entomol.* 6: 63-66.
- DAS, B.C. & CHAKRABARTI, S. (1988c): Seasonal occurrence of *Aphidius matricariae* Haliday (Aphidiidae: Hymenoptera) in Garhwal range of north west Himalaya. *Indian J. Ent.* 50: 388-389.
- DAS, B.C. & CHAKRABARTI, S. (1989a): Aphidiid parasitoids (Hymenoptera: Aphidiidae) of graminaceous aphids in Garhwal, western Himalaya. *Orient. Insects.* 23: 365-372.
- DAS, B.C. & CHAKRABARTI, S. (1989b): Two new aphid parasitoids (Hymenoptera: Aphidiidae) from Garhwal range of western Himalaya, India. *Entomon* 14: 339-343.
- DAS, B.C. & CHAKRABARTI, S. (1989c): *Praon himalayensis*, a new walnut aphid parasitoid (Hymenoptera: Aphidiidae) in Garhwal range of western Himalayas. *Entomon* 14: 345-347.
- DAS, B.C. & CHAKRABARTI, S. (1990): New and little known aphidiid parasitoids (Hymenoptera: Aphidiidae) of gall forming aphids in western Himalaya, with notes on their seasonal history. *Orient. Insects* 24: 399-414.
- HALIDAY, A.D. (1834): Essay on the classification of parasitic hymenoptera of Britain, which correspond with the *Ichneumonones minuti* of Linn. *Ent. Mag.* 2: 93-106.
- SAHA, S. & CHAKRABARTI, S. (1987): New records of aphids (Homoptera: Aphididae) from Garhwal range of western Himalaya, India. *J. Bombay nat. Hist. Soc.* 85: 633-635.

A NEW SPECIES OF WHITEFLY *DIALEUROPORA HEPTAPORA* SP. NOV.
(ALEYRODIDAE : HOMOPTERA) FROM INDIA¹

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(With a text-figure)

During the course of field collection of whiteflies, a species of *Dialeuropora* collected from *Hiptage* sp. in Ambalamedu, Kerala, on 4 December 1989 was found to be new to science and is described here.

Dialeuropora heptapora sp. nov. (Fig. 1)

Pupal case: White, oval, thin, found on the lower surface of leaves, 1.08-1.13 mm long and 0.80-0.85 mm wide.

Margin: Crenulate, 16-17 crenulations in 0.1 mm; thoracic and caudal tracheal pores present; anterior marginal setae 20 μ long and posterior marginal setae 25 μ long.

Dorsal surface: Four pairs of dorsal setae – cephalic setae 5-7.5 μ long, first abdominal setae 5-12.5 μ long, eighth abdominal setae 5-7.5 μ long and submarginal caudal setae 7.5 μ long. A row of seven pairs of large pores and porettes (4 on cephalothorax and 3 on abdomen on submargin near the margin present. A row of five pairs of submarginal setae (4 on cephalothorax and one on abdomen) each 7.5 μ long. Longitudinal moulting suture reaches the margin, whereas transverse moulting suture reaches subdorsum. A pair of thick round markings submedially on each segment present. Numerous thin round markings sparsely distributed throughout the dorsum. Submargin and subdorsum covered with numerous microtubercles.

Vasiform orifice subcircular, wider than

¹Accepted February 1991

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